OIL AND GAS COMMISSION

Geophysical Guidelines for
the Muskwa-Kechika Management Area

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OIL AND GAS COMMISSION

The Oil and Gas Commission (OGC) regulates oil and gas activities and pipelines in British Columbia to provide for the sound development of the oil and gas sector, by fostering a healthy environment, a sound economy and social well being. A Commission goal is to provide transparency and consistency in regulatory delivery. A series of operating codes and guidelines are developed to assist our clients, First Nations and stakeholders.

The responsibilities of the Oil and Gas Commission – relevant acts, specified enactments and regulations include:

Oil and Gas Commission Act
Petroleum and Natural Gas Act
Pipeline Act
Water Act
Forest Act
Forest Practices Code of British Columbia Act
Land Act
Waste Management Act
Heritage Conservation Act

Copies of the regulations are available through Crown Publications or www.ogc.gov.bc.ca

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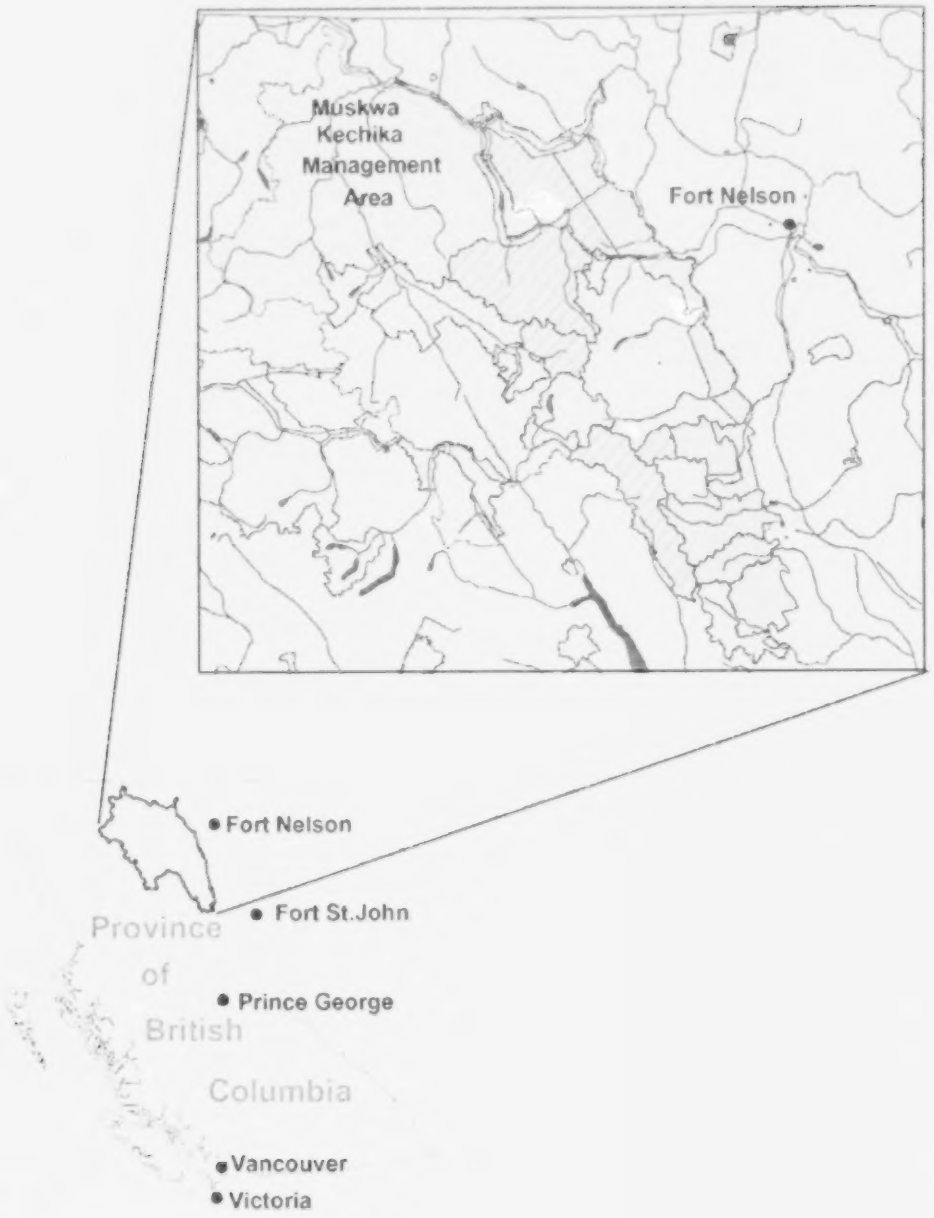
Figure 1: Map of the Muskwa-Kechika Management Area



1.0 PURPOSE OF THE GUIDELINE

1-1 The purpose of this guideline is to encourage all geophysical exploration to be environmentally sensitive to the significant resource values in the Muskwa-Kechika Management Area (M-KMA) and consistent with the *M-KMA Act* and the objectives set out in the M-KMA Management Plan.

1-2 It provides enhanced minimum standards for a range of geophysical activities; standards that generally exceed those that are required outside of the M-KMA.

1-3 It ensures that proponents, government agencies and stakeholders have a common understanding of the standards that apply to geophysical exploration in the M-KMA.

1-4 The guideline should not be viewed as prescriptive or limiting, such that an operator would be discouraged from seeking continuous improvement and efficiencies in their geophysical program (see Adaptive Management below)

2.0 ADAPTIVE MANAGEMENT / CONTINUOUS IMPROVEMENT

2-1 Consistent with the intent of the M-KMA Act, proponents are expected to join in a process of adaptive management, including the development of innovative alternatives to standard approaches, monitoring, learning and cooperating in problem solving. The goal of adaptive management is to promote continuous improvement in geophysical activities and technologies. Design of an adaptive management approach will consider environmental, social and economic factors.

2-2 Proponents will be encouraged to engage in 1) "proactive" adaptive management approaches – well planned activities based on thorough consultations, and 2) "retroactive" approaches – learning from past actions.

3.0 PUBLIC CONSULTATION

3-1 Proponents will conduct a public involvement process with First Nations, tenure holders and affected parties to exchange information on proposed seismic programs and their timing, to identify concerns, and to make best efforts to resolve concerns and avoid and/or mitigate impacts. The names, phone numbers, dates and method of contact with affected parties should be recorded in the Geophysical Application and Field Assessment form. Proponents will also record the issues that were raised, whether they were resolved or unresolved, and planned mitigation measures.

3-2 The OGC Public Involvement Guideline, available on the internet at http://www.ogc.gov.bc.ca/documents/guidelines/revised-Public%20Inv.%20GL.pdf describes the roles and responsibilities of the proponent, the regulator and the public in conducting consultations and offers strategies for conducting and completing a public involvement process.

3-3 Communications between the proponent and potentially affected parties may be improved through the use of the publication, Best Practices in Tenure-to-Tenure Holder Relations, "Tools for Tenure Holders." This guide, developed through the Coordinated Tenures Project, promotes Best Practices in tenure-to-tenure holder relations, including practical suggestions for the sharing of information and on-the-ground activity coordination (website being developed by MSRM- to be finalized by April 31, 2004).

4.0 STRATEGIC DIRECTION

Proponents are referred to the following strategic planning documents that, collectively, provide direction for all oil and gas activities in the M-KMA:

The *MKMA Act*	Fort St. John, Mackenzie and Fort Nelson LRMPs
The MKMA Management Plan	Pre-Tenure Plans (PTPs) for the M-KMA

All geophysical activities must be consistent with the LRMP objectives referenced in the MKMA Management Plan. The M-KMA Plan is available on the Internet at: http://srmwww.gov.bc.ca/rmd/lrmp/frtnelsn/app7/app7toc.htm. PTPs do not set management direction for geophysical activities but do provide information that is of value to a geophysical proponent in planning for their activities.

The OGC recommends that proponents acquire these documents in order to become familiar with the overall management framework that applies to the M-KMA and, more specifically, to understand the objectives that apply to geophysical activities.

The preamble of the *Muskwa-Kechika Management Area Act* identifies the M-KMA as an area of unique wilderness of global significance and outlines the following management intent with respect to oil and gas activities:

"....to maintain in perpetuity the wilderness quality, and the diversity and abundance of wildlife and the ecosystems on which it depends while allowing resource development and use.....including.....oil and gas exploration and development."

General Management Direction in the management plan focuses on three main points:

- *The management intent for the M-KMA is to ensure wilderness characteristics, wildlife and its habitat are maintained over time, while allowing resource development and use, including...oil and gas exploration and development.*
- *The integration of management activities especially related to the planning, development and management of road access within the M-KMA is central to achieving this intent.*
- *The long-term objective is to return lands to their natural state, as much as possible, as development activities are completed.*

The General Management Objectives referenced in the M-KMA Management Plan are reflected in the following summary of objectives (drawn from M-KMA Pre-Tenure Plans):

- The structure and function and distribution of ecosystems remain within a natural range
- Habitat elements for each focal species are sustained in winter habitat capability classes that range from 1-6 within each biophysical zone
- Areas of special biological significance are conserved physically and functionally
- Ecosystems disturbed by development are restored to simulate natural pre-development conditions
- Soil resources are able to sustain productive ecosystems
- Maintenance of water quality and quantity within the natural range of variation.
- Recognition of Treaty rights and consideration of First Nations' traditional knowledge
- Opportunities for employment and other economic benefits are explored with First Nations
- Effective extraction of provincial oil and gas resources
- Minimizing impacts of oil and gas activities on non-energy sectors with direct interests in the planning area through avoidance or mitigation measures
- Maintain wilderness quality over time

For context on the above, PTPs can be found on the Internet at:
http://srmwww.gov.bc.ca/rmd/ecdev/mog/ptp/index.htm

The original Land and Resource Management Plan objectives that apply to specific drainages within the M-KMA, and would therefore apply to individual geophysical projects, may be accessed on the Internet at http://srmwww.gov.bc.ca/nor/planning/lrmp.html.

5.0 OPERATOR SUBMISSION REQUIREMENTS

5-1 Proponents are required to complete a Geophysical Application and Field Assessment (GAFA) form (available at http://www.ogc.gov.bc.ca/documents/forms/geophysical/Geophysical%20Application%20and%20Field%20Assessment.doc).

5-2 Proponents should refer to "OGC Geophysical Application and Field Assessment Guide" for assistance in completing the application (available at http://www.ogc.gov.bc.ca/documents/checklists/geophysical/Geophysical%20Application%20and%20Field%20Assessment%20Guide.doc).

5-3 While the GAFA Guide provides general operational planning direction, it is expected that each section of the GAFA form will be completed to a higher level of detail for programs located in the MKMA. Biophysical resources and values information is available in the PTPs and on websites listed under information sources for each of the PTP areas. Operators to design a minimal impact geophysical program will utilize this information, together with information gathered during the consultation process.

5-4 Proponents will forward a copy of their geophysical program to the Ministry of Sustainable Resource Management, Fort St. John, for information. The application is not forwarded to seek comments on the application or serve as a referral. It will be forwarded to ensure staff involved in the management of the M-K are aware of pending activities; and to ensure that the Oil and Gas Commission and geophysical proponents are made aware of other ongoing projects in the M-K that could be impacted by the proposed project (e.g. baseline wildlife research).

5-5 On submission of the application, the OGC may request that the proponent provide additional field information and/or modify their proposed geophysical project to avoid, mitigate and minimize impacts.

6.0 PRE-TENURE PLANNING CUMULATIVE IMPACT ACCOUNTING SYSTEM

6-1 New disturbances from geophysical activity in the M-KMA will be included in the monitoring of Pre-Tenure Plan targets for species conservation, conducted by the Ministry of Sustainable Resource Management.

6-2 PTPs have also established disturbance thresholds for specific focal species by pre-tenure planning unit.

6-3 Proponents will continue to report totals of areas disturbed by geophysical activities to the OGC as part of the existing reporting requirements. In addition, it is expected that proponents will use geographic information systems to calculate disturbance by habitat type in order to meet PTP reporting requirements. Contact OGC Geophysical Program Manager for additional information.

6-4 Some types of line clearing significantly reduce impacts on soils and vegetation cover and result in less reportable disturbance (e.g. Minimal Impact Line).

6-5 Other disturbances from geophysical activities may be time limited (i.e. they only constitute a disturbance when they are in place; such as winter-only disturbances) and once reclamation occurs, they will not contribute to the threshold "account."

6-6 Geophysical activities that disturb surface soil layers and remove vegetation will have similar reclamation requirements as specified in PTPs.

7.0 SPECIFIC OPERATIONAL DIRECTION

7-1 The Special Management Zones in the MKMA require that special measures be used when working in this area, so that overall footprint is minimized.

7-2 The guidelines provided in Table 1 apply to geophysical activities within the MKMA and are supplementary to all other existing operating standards and procedures. The proponent in completing the Geophysical Application and Field Assessment form must reference these guidelines.

7-3 The specific guidance provided in Table 1 is directed at achieving operator compliance with the management objectives referenced in the M-KMA Management Plan, and contained in the Fort St. John, Mackenzie and Fort Nelson Land and Resource Management Plans (LRMPs). The table describes specific operational measures and minimum standards that are consistent with meeting the objectives of these plans. If there is a discrepancy between these guidelines and the LRMP strategies, then the LRMP strategies shall prevail.

Table 1: Minimum Geophysical Project Guidelines for the Muskwa-Kechika Management Area

Geophysical Project Elements	Specific Guidance
1.0 Planning	1.1 Planning for geophysical activities in the M-KMA will require that the proponent draw on the advice of a qualified biologist or technician with the capacity to: a) access and evaluate existing and required biophysical information, b) interpret and apply guiding literature related to the interaction between geophysical activities and other resources values to design a least-impact program, c) monitor geophysical activities to prescribed standards, and d) modify geophysical programs and develop strategies to avoid, minimize and mitigate the impacts of geophysical activities on other resources and values. Often these skills will be applied within a "best practices" framework. 1.2 Operational timelines to reduce impacts on specific fish and wildlife species is available online from the following documents: a) Timing Windows Background Document- http://www.ogc.gov.bc.ca/documents/informationletters/Fish%20and%20Wildlife%20Timing%20Windows.pdf b) Table of Fish & Wildlife Timing Windows for Selected Species- http://www.ogc.gov.bc.ca/documents/informationletters/Fish%20and%20Wildlife%20Timing%20Windows%20Table.doc c) Stream Crossing Planning Guide(Northeast BC)- http://www.ogc.gov.bc.ca/documents/guidelines/Stream%20Crossing%20Planning%20Guide.doc 1.3 The proponent will: a) Carry out a public consultation process as described in the Public Consultation section b) Identify wildlife populations that may be impacted by the proposed geophysical program and other issues of concern based on: o local knowledge from consultations with First Nations, guide outfitters, trappers, etc. o key and unique resource values and uses identified in each Pre-Tenure Plan area (see Pre-Tenure Plan document- http://srmwww.gov.bc.ca/rmd/ecdev/mog/ptp/index.htm) o resource inventory information available online for each Pre-Tenure Plan area (see MSRM website) o reconnaissance level field evaluation. c) Use best practices to design an appropriate geophysical program, using the guidelines that follow in this Table.

Geophysical Project Elements	Specific Guidance
1.0 Planning (Cont'd.)	c) Use the information gathered in (a-c) above to complete the Geophysical Application and Field Assessment form (see operator Submission Requirements). 1.4 Drawing on the minimum standards provided in this Table, proponents are required to achieve an overall program design, including line layout and line clearing, that avoids, minimizes and mitigates impacts on wilderness quality, wildlife and recreation and that avoids the creation of motorized and non-motorized access. 1.5 In general, proponents are required to reduce the cumulative impacts of geophysical disturbance in the M-KMA, by limiting the contribution of each geophysical project, by coordinating geophysical programs and through employing environmentally sensitive geophysical techniques. 1.6 Workers who understand the reasons for the M-KMA and these guidelines will be more likely to carry out their work in a manner that achieves the management intent for M-KMA . Proponents are to provide an orientation to all employees and contractors involved in planning activities or working in the project area. This will include notification to workers that recreational use of the area is prohibited while accessing the area for industrial purposes.

Geophysical Project Elements	Specific Guidance
2.0 Line Layout / Line Density	2.1 The number and width of lines will be minimized and monitored to ensure disturbance remains within prescribed PTP thresholds. 2.2 Proponents will coordinate their line clearing requirements with other operators. 2.3 Existing lines should be utilized wherever possible. 2.4 Re-growth on existing lines must be indicated and pictures submitted at time of application.
3.0 Line Clearing	3.1 On steep, unstable, or erodable terrain, lines will be hand-cut. 3.2 On more favourable terrain, lines may be cleared mechanically with mulchers. 3.3 Cleared lines will be no more than 2.0 metres in width. 3.4 Line clearing will use avoidance methods to minimize line-of-sight and cutting of merchantable timber. 3.5 Harvesting techniques shall consist of minimal removal of vegetation, conform to all legislation and Workers' Compensation Board regulations. 3.6 Other mechanical methods will only be considered if it can be demonstrated that they will not result in significant environmental impacts (e.g. use existing cat-cut lines).
4.0 Vegetation	4.1 Ground and duff disturbance must be minimized. 4.2 Cutting of alpine and sub-alpine vegetation must be avoided.
5.0 Stream Crossings	5.1 Operational timelines to reduce impacts on specific fish and wildlife species is available online (see Planning). 5.2 Stream crossing methods must be appropriate to the type of crossing and comply with the provincial Fish-Stream Crossing Guidebook, available on the internet at http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/FishStreamCrossing/FSCGdBk.pdf. Contact an OGC Land and Habitat Protection Officer for more information.
6.0 Lines of Sight	6.1 Doglegs must be used where seismic lines intersect roads and trails. 6.2 Where avoidance techniques cannot be used, or existing lines are not present, incorporate wildlife blinds every 200 meters.
7.0 Campsites	7.1 Campsites and staging areas are to be located outside of the M-KMA boundary. 7.2 Campsites and staging areas must be indicated on preliminary application submission, including: o existing clearings and openings, o existing abandoned wellsites (with Certificate of Restoration), o camps that are to be used for less than 30 days.

Geophysical Project Elements	Specific Guidance
8.0 Aerial Based Operations	8.1 Aerial based operations include Heliportable, Heli-assist, Gravity and Aeromagnetic Surveys. 8.2 Heliportable lines are restricted to 1.5 meters in width and will occur in areas of unstable terrain and higher elevations, where season and timing dictates. 8.3 The involvement of a qualified biologist or technician is critical in developing suitable mitigation strategies for fish and wildlife protection. 8.4 Wildlife timing windows will be met, as described in Information letter #OGC 03-13, available on the internet at http://www.ogc.gov.bc.ca/documents/informationletters/OGC-03-13%20Timing%20Windows%20Information%20Letter.doc. 8.5 A proponent may request a variance of an identified timing window, if the proponent is able to demonstrate that it is unavoidable and mitigation plans minimize potential wildlife impacts. Requirements for mitigation plans are outlined in Timing Windows Background Document (see web-link under specific guidance 1.2) 8.6 The Ministry of Water, Land and Air Protection is currently developing a Best Practices guide which will assist industry in developing appropriate procedures for aircraft use. In the interim, proponents are required to develop a wildlife flight plan that includes the following elements: o Identifies wildlife species of concern and seasonal (timing) windows. o Designates avoidance distances. o Predetermines suitable flight routes. o Specifies suitable landing sites. o Includes information on other activities in the area to assist in coordination with other programs to reduce cumulative impacts. o Communicates the wildlife flight plan to all pilots and field staff before operations begin. o Provides for monitoring of wildlife sightings o Provides for regular written reports (e.g. bi-weekly) to the OGC.

Geophysical Project Elements	Specific Guidance
9.0 Helipads	9.1 OGC Heliportable Helipad Placement Guidelines are available on the Internet at http://www.ogc.gov.bc.ca/documents/forms/forestry/HelipadGuidelines.doc . 9.2 The number of helipads will be kept to a minimum. 9.2 There will be no more than 1 helipad per 1km. of proposed line, unless otherwise indicated by safety requirements. 9.3 Wherever possible helipad placement will take advantage of natural openings and suitable sites that are immediately adjacent to cleared lines. 9.4 Potential helipad locations(s) should be situated in areas of lower wildlife habitat capability and must avoid special biological features (e.g. licks, wallows). 9.5 Helipads must be constructed with due regard to safety. 9.6 The number and size of helipads must be identified in the Geophysical Application and Field Assessment form and on the Schedule A map.
10.0 Clean-up of Operations	10.1 Work site cleanup activities will occur on an ongoing basis, concurrent with the geophysical project's progress. 10.2 No evidence of work, such as; flagging tape, lathe, signs, spray paint, etc. shall be left behind. Use biodegradable products where possible 10.3 No fuel, oil, and/or chemical storage within alpine, sub-alpine or riparian areas are permitted. 10.4 Fuel will be stored in a manner that provides for spill containment, such as double wall tanks or other suitable ground level containment. 10.5 All fuel barrels must be removed from the M-KMA prior to the end of the program. Fuel audits must be submitted to the OGC and WLAP, Pollution Branch upon program completion. The fuel audit will include records of how much fuel was hauled into the program area (e.g. number of barrels or tanks) and what was hauled out upon completion. All barrels or tanks must be accounted for. 10.6 All trash must be contained and removed to an approved land-fill outside of the M-KMA.

Geophysical Project Elements	Specific Guidance
11.0 Reclamation Planning and Activities	11.1 Erosion control measures must be specified within the application. 11.2 Methods to repair blowouts within 24 hours must be specified. 11.3 Methods to immediately plug any flowing holes encountered must be specified. 11.4 To minimize risk of flowing holes, erosion, and hole settling, shot hole filling will include some bentonite (or other material with similar properties). 11.5 A monitoring report will be required within one year of program completion. The report should include the results of: o reconnaissance level field checking to confirm level of vegetation re-growth, surface soil disturbance, erosion problems and any impacts at other environmentally sensitive sites(e.g. stream crossings). o the equivalent of a 1:20,000 scale photograph of the program area shall be taken from an aircraft as a measure of visual impact at the landscape-level. o A description of any unforeseen impacts and how they have been mitigated. o Any adaptive management approaches used and documentation of success or failures. 11.6 Seismic lines with evidence of ground disturbance, (e.g. removal of vegetation and duff layers) must be re-vegetated with indigenous plant species only. A weed-free, short-lived cover-crop can be used where necessary to stabilize soil and facilitate native species growth. As per the ecosystem restoration target in the PTPs, a more comprehensive reclamation plan will be required in these situations; the target being to return the ecosystem to its natural state as much as possible over time, consistent with the direction in the M-KMA Management Plan

Geophysical Project Elements	Specific Guidance
12.0 Other Considerations	12.1 The operational standards in this guideline, while generally applicable in the M-KMA, may vary for some areas already covered by pre-existing plans (e.g. Upper Sikanni Management Plan). Proponents are to discuss the location of their proposed geophysical project with OGC staff, to determine if other operational standards apply. 12.2 Other conditions may apply to address special management requirements, such as : o beetle infested trees, o spiritual or traditional use areas, o recreational sites, o culturally modified trees, o mineral licks, or o raptor nesting sites, 12.3 Vehicular access is only permitted along designated access routes in the MKMA. For ground-based operations a permit is required from WLAP for exemption from the vehicle access restrictions. Information on the M-KMA Access Management Area regulation can be found on the internet at: http:www.qp.gov.bc.ca/statreg/reg/W/Wildlife/183_99.htm 12.4 Access control such as signage, controlled access and deactivation upon completion of the program may be required. 12.5 Signage: o must be located at the nearest point of access in relationship to the M-KMA boundary. o must indicate program name, program number, operator name and type of activity being carried out (e.g. Heliportable program in progress). o must be removed upon completion of the program.
13.0 Archaeological Assessments	13.1 Proponents may be required to conduct an Archaeological Overview Assessment and/or a Post Selective Archaeological Impact Assessment if circumstances warrant. Typically, Post Selective Archaeological Impact Assessment is required in areas of high archaeological potential and where mechanical line cutting methods are employed. 13.2 More specific guidance on procedures for conducting these assessments is available on the OGC website at http://www.ogc.gov.bc.ca/archaeology.asp 13.3 If there are known (recorded) archaeological sites, then avoidance techniques are required. 13.4 Use techniques that minimize disturbance of duff layer (i.e.. hand-cut and mulchers, as noted earlier), reducing the likelihood that Post Selective Arch. Impact Assessments will be required.

Geophysical Project Elements	Specific Guidance
14.0 Area-specific and Species-specific Guidance	14.1 Operational timelines to reduce impacts on specific fish and wildlife species is available online (see Planning) 14.2 Strategy for geophysical operations from Fort St. John LRMP: "All new-cut seismic exploration in areas with potentially unstable slopes and/or high environmental values shall be heli-portable unless it can be conclusively demonstrated that conventional seismic exploration will not cause significant environmental impacts." 14.3 Within the Higher Elevation Zone of Sulpher/8 Mile there is a lack of information about Stone's Sheep, a species of particular importance in this area. The PTP Public Advisory Group (PAG) have a) recommended initiating research on Stone's Sheep populations and habitat immediately, while b) delaying the development of management direction and the issuing of tenures for five years (by Dec. of 2009), until research findings are available. More information on this management approach can be found in sections 7.11 and 9.1.1 of the Pre-Tenure Plans for Oil and Gas Development in the M-KMA. The PAG developed recommendations regarding geophysical operations because it was felt that geophysical activities are an important contributor to potential Stone's Sheep impacts. The Higher Elevation Zone is shown in Fig. 2. The OGC will implement the PAG agreement by reviewing all geophysical proposals to ensure they: o recognize the special circumstances and interests of the Higher Elevation Zone, o recognize the Stone's Sheep research program and mitigate potential effects, and o incorporate new information and research from the Stone's Sheep studies as it becomes available. Proponents will use qualified personnel to plan and implement appropriate strategies to mitigate potential impacts on Stone's Sheep and will consult and share information with researchers to avoid and/or mitigate impacts on the research program. This general approach will be followed for other natural resource research being undertaken throughout the M-KMA. 14.4 Proponents will provide all crews with wildlife awareness information, and bear avoidance information, in particular. OGC may request that proponents develop hazard reduction plans for bears in some areas.

Figure 2- Biophysical Zones in the Sulpher/8 Mile